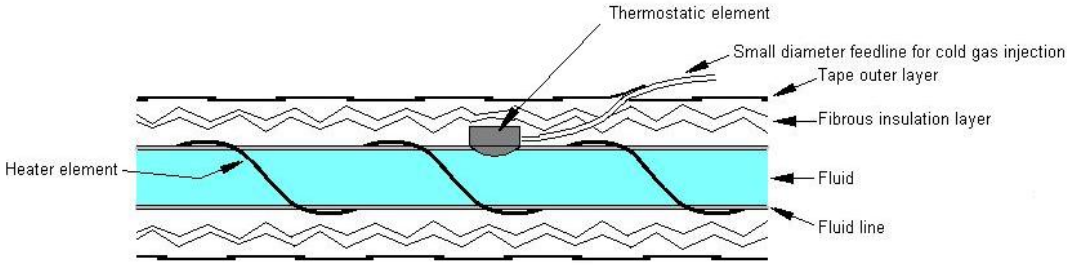
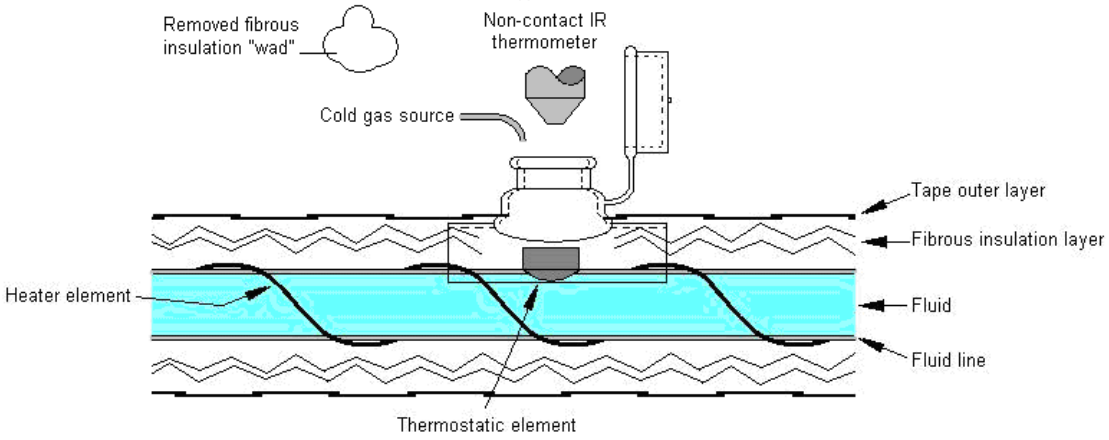
Notional Concept for testing Thermostats Covered by Insulation

Thermostat testing on insulated fluid lines

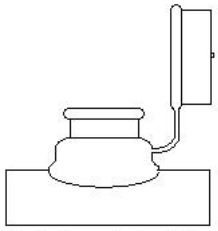
On insulated fluid lines, thermostats must often be stimulated with a cold source to facilitate checkout. Addition of test ports as detailed below could eliminate the need to "tear into" insulation for access (and eliminate potential for damage to electrical leads or heater elements). This could also reduce the time frame to retest a system late in the processing flow. Mass of the test port would probably be comparable to tape buildup that occurs when insulation must be cut to facilitate access to the thermostat.



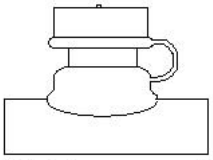
Option 1: Notional cold gas feedline to thermostat (suitable for excitation only, no direct visibility of thermostat temperature)



Option 2: Notional molded polymer test port with "snap cap" for direct access to thermostat (Allows excitation and direct visibility of thermostat temperature)



Molded polymer test port (open)



Molded polymer test port (closed)

Note: Molded plastic piece is installed during insulation installation, outer tape layer of insulation is wrapped so as to jacket the "base" of the test port molded plastic piece. Base of molded plastic piece is seated atop fibrous insulation. With cap open, a clear view is afforded of the thermostat except for a removable "wad" of fibrous insulation that can be inserted and removed as required for access on the ground.

Test cap could be molded from graphite-impregnated resin and grounded electrically if deemed desirable.

Test cap could be molded with provision for safety wiring.

Alternately, Peltier devices might be co-located with the cold junction resting against the thermostat. This suggests the possibility of “flip of a switch” thermal testing, but at a slight weight penalty. The feature might be desirable in those areas that are closed for flight early but which might require retest late in the processing flow, by eliminating the need for human access as a requirement for retest.

Example: APU heater retest, especially when performed repetitively for CIG/SCAN electrical restest.